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To whom it may concern

Report concerning Stanislav Gunàr's thesis

This thesis concerns the "multi-dimensional radiative transfer in quiescent prominences". The final objectives of this work is to better understand and diagnose these cool structures located in the hot corona. It addresses the important issue of the physical conditions within solar prominences, structures important from the double viewpoint of plasma physics (because of their confinement characteristics) and space weather (since they lead to Coronal Mass Ejections). The approach combines the multiwavelength observations of a few prominences and their thermodynamic diagnostic through heavy non-LTE radiative transfer modelling. It relies upon the possibility of accessing the data of the space solar mission SOHO.

A major result concerns the relationship found between the orientation of the magnetic field which "supports" the plasma with respect to the outgoing radiation, especially in the UV Lyman series. (Paper IV). In view of the discrepancies left between the predicted and observed line profiles, the author (with his colleagues) has performed a thorough and far more realistic modelling in a more complex geometry (Paper V). The observations are rather unique on SOHO and have led to far better (multithreads) models. **This is a major success.** The remaining discrepancies will be probably surmounted with the passage from two-dimensional to three-dimensional modelling, which is the "dream" of many solar physicists.

Overall, it is a very fine piece of work which represents an important step forward in the diagnostic of these magnetic structures immerged in the corona and confined by the magnetic field. Such objects are currently under investigation in magnetic chemically peculiar stars, G and K subgiants and active solar-type dwarfs which have huge prominences whose eruption also leads to Coronal Mass Ejections. This means that the methodology used, from both observational and theoretical standpoints, is of great interest for stellar physics.

The prospects outlined in the Conclusions (section 6) of the thesis as a continuation of this work (essentially in radiative transfer and three-dimensional modelling) are both ambitious and promising. (Note that the 3D radiative transfer is made more difficult here because of the external illumination of the structures). Stanislav Gunàr is well at ease in computational physics and should find the right path to overcome the enormous computational difficulties.

The document is well organized, with essentially six sections where the basic one entitled "results and publications" summarizes the main results obtained in **five** papers published between 2005 and 2007, in **major** journals of Astronomy. These summaries are succinct and accompanied by the relevant figures which are well explained. The five subsections corresponding to the five papers are linked together on the basis of the improved connection between observations and theory, and I read them with much interest and pleasure.

I consider this document as an excellent doctoral thesis. It clearly indicates that Stanislav Gunàr is able to perform valuable creative scientific work in solar and stellar physics. ../..

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